Product Brief

ABT2010 Video Processor

Single-Chip Advanced Video Processor

The ABT2010 is a high performance video format conversion IC designed for A/V Receivers, Blu-ray® player/ recorders and digital displays.

Applications

- AV Receivers
- Blu-ray Players/Recorders
- Displays
- Digital Media Devices

Key Features

- 10-Bit SD/HD Precision Deinterlacing
- 10-Bit Precision Video Scaling for up-conversion to 1080p and down-conversion to 480i
- 12-Bit Pre-processing and Post-processing blocks
- SD/HD Noise Reduction and Picture Enhancement
- PReP™ – Progressive Re-Processing for improving progressive signals in sink applications
- CEA-861D Compliant Timing
- On Screen Display
- Deep Color and xvYCC colorimetry

PReP™

- Industry's first technology to recover the original interlace signal from a poorly deinterlaced source

The ABT2010 features Video Reference Series™ (VRS™) technologies, including Silicon Image's proprietary Precision Deinterlacing™ for both SD and HD resolutions which provides arbitrary cadence detection as well as five-field motion and edge adaptive deinterlacing for an artifact-free viewing experience. The ABT2010 also includes Precision Video Scaling™ that independently scales an image horizontally and vertically to achieve outstanding picture quality and includes MPEG noise reduction and picture enhancement. The ABT2010 also includes Progressive Re-Processing™ (PReP™) technology; a unique processing method that recovers the original interlace signal from a low quality progressive video signal for processing by the Precision Deinterlacing engine.

The ABT2010 supports Deep Color with 10 bit input and 12 bit output as well as Frame Rate Conversion (FRC).

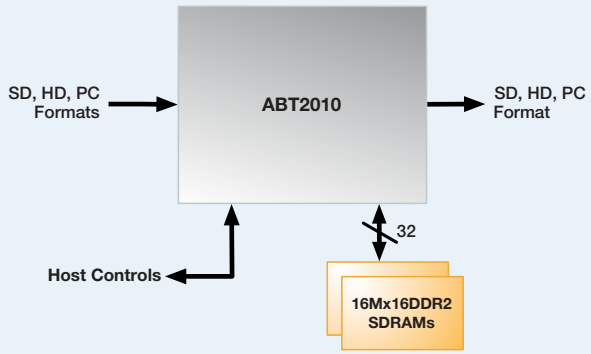
Precision Deinterlacing

- Award-winning deinterlacer supporting 480i, 576i, 1080i50, and 1080i60 inputs
- Arbitrary cadence detection (any-to-any) to detect 2:2, 3:3, and non-standard cadences
- Five-field motion and edge-adaptive deinterlacing
- Three-frame video processing with low-latency gaming modes
- Bad edit detection to minimize artifacts caused by sequence breaks in film content
- Detection of multiple source types within a frame – for example, video titles over film
- Detection of transitions between different progressive source types
- Cadence detection of 480p, 576p, 720p, and 1080p sources for frame rate conversion to 1080p24

Precision Video Scaling

- Award-winning vertical and horizontal up and down scaling engine supporting a wide range of PC and video formats
- Panoramic stretch mode to support 4:3 content on a 16:9 display
- Tearless frame rate conversion
- Full aspect ratio control
  - Supports multiple input aspect ratios
  - Supports multiple display aspect ratios
- Zoom, pan, and border functions

ABT2010 System Block Diagram



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MPEG Noise Reduction

- Mosquito noise reduction for SD/HD formats

Picture Enhancement

- Detail enhancement to increase fine detail or reduce noise for overly enhanced images
- Edge enhancement to sharpen edges or to reduce overly enhanced edges

Picture Controls

- Brightness, contrast, saturation, hue, sub-pixel YC delays
- Output black level controls
- Gamma Controls
- Calibration controls including 3x3 matrix

Input

- 24/30-bit RGB/YCbCr 4:4:4
- 16/20-bit YCbCr 4:2:2
- 8/10-bit YCbCr 4:2:2 (ITU-R BT.656)
- Supports a wide range of video and PC formats including 1080p and WUXGA
- Separate and embedded syncs, DE generation, BT.656 support
- 150MHz maximum input clock

Output

- 24/30/36-bit RGB/YCbCr 4:4:4
- 16/20/24-bit YCbCr 4:2:2
- 8/10/12-bit YCbCr 4:2:2 (ITU-R BT.656)
- Supports a wide range of video and PC formats including 1080p and WUXGA

On-Screen Display (OSD)

- Character-based OSD supports transparency with adjustable foreground/background color
- 256-character set with 12 x 24 or 128-character set with 24 x 24 characters
- 128 x 32 character map which can be freely positioned anywhere on the screen

Controls and Clocks

- I^2C- compliant serial interface
- ABT Serial™ interface – four-wire fast serial interface of up to 10.0 MHz
- Integrated PLLs

Memory

- DDR2 SDRAM
  - 256 Mbit (16M x 16) or larger
- Flexible memory interface supporting 1 or 2 memory devices

Test Pattern Generator

- Flexible test pattern generator under software control to provide reference test patterns for calibrating displays

Pass Through Mode

- All formats including 1080p and 3D over HDMI formats.

Audio Delay

- 10-channel I^2S audio support (HDMI 1.3)
- Supports up to 640 ms of audio delay
- Multiple formats including multi-channel audio (compressed, PCM)

Package

- 316 TEBGA (27 mm x 27 mm)

Voltage

- 1.0V Core, 3.3V I/O, 1.8V Memory

Power

- < 3W

Enhancing the connected HD experience

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